

.

---

## **Available Goddard Space Flight Center Services**

---

**This Description applies only to proposals in response to  
NASA's Announcement of Opportunity for Medium-class Explorers  
(MIDEX) and Missions of Opportunity**

**AO 04-OSS-XX**

Revised  
**November 14, 2003**

### Available Goddard Space Flight Center Services

Goddard Space Flight Center (GSFC) services are offered in GSFC's core competency areas of sensors and instruments, end-to-end mission systems engineering, and advanced flight and ground systems development. For Step 1 proposals, the 40 hours of service offered at no cost to the PI can be spread across all three areas or concentrated on some subset of them – at the PI's discretion. Typical support provided in each area is as follows:

#### Sensors and Instruments:

- General overview of sensor/instrument applicability to the stated science objective(s)
- Assessment of the technical feasibility of the proposed sensor(s)/instrument(s)
- Grass roots cost estimate of the proposed sensor(s)/instrument(s)

#### End-to-end mission systems engineering:

- General systems engineering assessment of the proposed mission concept
- Assistance in the creation of a science requirements traceability matrix
- Assistance in the identification of top technical risks and mitigation methods

#### Advanced flight and ground systems development:

- General overview of the proposed flight and ground system
- Assistance in the creation of a data flow diagram with related frequency band(s), ground station(s), and data rate(s)
- Grass roots cost estimate of the proposed flight and ground system

For Phase A concept studies, GSFC will provide support in these core competency areas to the extent required by the PI to complete the study. In addition, GSFC will also provide support in its project management core competency area during Phase A studies. Phase A support is provided on a full-cost basis. Of special note to all PIs is the fact that NASA procurement regulations require industry partners to be selected competitively if GSFC is to manage the mission. GSFC will require the PI to demonstrate that such a process has been or will be conducted prior to entering in to any teaming arrangement for the concept study.

To obtain these services, PIs should contact Mr. William Cutlip of GSFC's New Opportunities Office. Mr. Cutlip will serve as the point of contact and coordinator for GSFC-provided services. In this role, Mr. Cutlip will interact with PIs to understand the needs, scope the effort, develop action plans and make arrangements to satisfy them. Information to contact Mr. Cutlip is provided below:

Mailing address	NASA/GSFC Code 101 Bonnie Norris, Chief New Opportunities Office Greenbelt, MD 20771
Permanent email address	Bonnie.G.Norris@nasa.gov
Business phone	301 286-5442
FAX number	301 286-0329

### **Other GSFC Services**

In addition to the services noted above, GSFC offers focused, discrete services in the areas of spacecraft acquisition; mission concept design; instrument synthesis/analysis; mission operations; and Space Shuttle/Space Station attached payload-related mission integration engineering and management, safety, mission implementation and carrier development. Each of these discrete services has well-defined products, which are described in the following sections. These services are offered in both Step 1 and Phase A as available resources permit. The cost of services, and acceptable means of payment, should be discussed directly with the designated point of contact for the service.

#### ***Rapid Spacecraft Development Office (RSDO)***

The Rapid Spacecraft Development Office (RSDO) services include the following:

- The definition, competition and acquisition of multiple (currently 8) “Indefinite Delivery, Indefinite Quantity” (IDIQ) spacecraft contracts (Rapid II) that offer NASA and other U.S. Government agencies a quick procurement tool for numerous spacecraft buses from a variety of U.S. and Foreign aerospace vendors. The Rapid II contracts provides for
  - o The modification of buses and contract terms & conditions to meet customer/mission needs
  - o In-House Studies and Requests for Information from vendors
  - o Instrument requirements definition & accommodation studies via vendors
  - o The competitive award of a fixed-price spacecraft bus development Delivery Order 60 to 90 days after Request for Offer (RFO) release
  - o Management of awarded Delivery Order transferred to customer’s federal government contracting officer (The use of the RSDO does **not** make GSFC a partner in the mission)

Currently, there are 21 core spacecraft bus configurations in the RSDO catalog. Additional information can be found at <http://rsdo.nasa.gsfc.gov>.

<b>BUS CONFIGURATIONS</b>	
<b>COMPANY</b>	<b>SPACECRAFT BUS</b>
Astrium (Germany)	FLEXBUS
Ball Aerospace	BCP600, BCP2000
Lockheed-Martin	LM900
Orbital Science Corporation	PICOSTAR, MINISTAR, MICROSTAR, STARBUS, LEOSTAR-2 & MIDSTAR
Spectrum Astro	SA-200B, SA-200S & SA-200HP
Surrey (United Kingdom)	SNAP, MICROSAT-70 & MINISAT-400
Swales	EO-SB
TRW	T100, T200A, T200B & T310

<b>RANGE OF BUS CAPABILITIES</b>	
Lifetime	1 to 10 years
Max Avg. Payld Power (EOL)	2.5 to 730 Watts
Payload Mass Limit	3 to 780 kg
Science Data Downlink Rate	38 kbps to 320 Mbps
Downlink Band	S-Band & X-Band
Science Data Storage Capacity	0 to 134 G-bits
Attitude Control Systems	3-axis stabilized & spinner
Propulsion	None, GN2, N2H4, Hydrazine
Orbits	LEO, MEO, GEO & Sun-Synchronous

Mailing Address:

NASA/GSFC Code 406  
 Gregory F. Smith, Chief, Rapid Spacecraft  
 Development Office  
 Greenbelt, MD 20771

Web Pages

<http://rsdo.gsfc.nasa.gov>

Permanent email address

Gregory.F.Smith@nasa.gov

Business phone

1-301-286-1289

FAX number

1-301-286-0530

*Integrated Design Capability*

The NASA Goddard Integrated Design Capability (IDC) is a human and technology resource that provides rapid development of space system analysis and conceptual designs. The IDC consists of mission and instrument rapid, collaborative, concurrent engineering design centers as well as the Access To Space website which provides mission planners on-line access to rideshare opportunities and launch access information. These IDC resources provide the groundwork to develop design concepts and related analyses for space missions and remote-sensing instrumentation. The IDC's two dedicated facilities are the Integrated Mission Design Center (IMDC) and the Instrument Synthesis and Analysis Laboratory (ISAL).

IDC services include:

- Full end-to-end studies including system/subsystem concepts, requirements and trades
- Focused studies
- Independent assessments of Investigator-provided studies/concepts
- Technologies and risk assessments

*Integrated Mission Design Center (IMDC)*

The IMDC provides specific mission engineering analysis and provides end to-end mission design products. IMDC mission design sessions are typically one full week and are tailored to fit an investigator's specific mission requirements. The IMDC will provide support ranging from one day brainstorming sessions to an extended design session, as required. IMDC personnel will work with the Investigator Team prior to the mission design session to understand the mission goals and objectives, the science driving requirements, the instrumentation and mission configuration and architecture, and the goals of the IMDC session. The Investigator is a key member of the IMDC process and during the study period is the integral decision-making member in the IMDC. This partnership engages the Investigator in the design process and provides him/her the opportunity to influence and refine the mission study objectives throughout the design process. This enables the IMDC to make the best decisions in real time and has been proven to result in the best product to meet the Investigator's needs.

*Instrument Synthesis and Analysis Laboratory (ISAL)*

The ISAL provides instrument design and analysis services to investigators and instrument teams. The ISAL focuses on individual scientific instruments. This laboratory was created to provide end-to-end capabilities for modeling, analysis and simulation for Earth and Space science remote sensing instruments. Design and analysis tools are integrated to facilitate quick and efficient analyses covering areas such as structural, thermal, optical, jitter, mechanisms, electronics, detailed radiometry, spectrometry, hyperspectral imaging, and interferometry. Performance modeling (physics-based functional modeling) and integrated physical or geometric modeling (structural, optical, thermal, etc.) are accomplished for both performance analyses and for time-domain simulations. This capability allows efficient trade-offs of instrument concepts and architectures, including cost and performance validation. As in the IMDC, the investigator is a key member of the ISAL process and during the study period is the

integral decision-making member in the ISAL. A typical ISAL instrument design study can be executed over a 2-week period.

To obtain more information regarding the use of IDC services, Investigators should contact Ms. Ellen Herring, the IDC Operations Manager. Initial IDC interaction with Investigators will result in the understanding of Investigators' needs, the development of strategies to meet these needs, and the scheduling of follow-up IDC, either IMDC and/or ISAL activities as deemed necessary. Information to contact the IDC is provided below.

Mailing Address:

NASA/GSFC Code 500  
Ellen Herring, IDC Operations Mgr  
Greenbelt, MD 20771-0001

Web Pages

<http://idc.nasa.gov/>  
<http://imdc.nasa.gov/>  
<http://isal.nasa.gov/>  
<http://accesstospace.nasa.gov>

Permanent email address

Ellen.Herring@nasa.gov

Business phone

1-301-286-7393

FAX number

1-301-286-0343

***Mission Operations and Development***

The Space Science Mission Operations Project is responsible for NASA's oversight after the mission completes its on-orbit verification. This project is involved during the development phase to assure that the mission can be operated safely and effectively. The complexity, cost, and risk of operations may be dramatically affected by decisions made early in the development cycle. A major objective of the Space Science Mission Operations Project, in conjunction with the science community, is to transfer lessons learned from current and past operations into the operations requirements and operations concept development phases of future missions.

GSFC can provide assistance for the following disciplines:

- Definition of mission operations concepts and applicability of existing mission concepts and architectures
- Assistance in obtaining cost estimates for GSFC mission operations
- Assistance in orbit design alternatives to meet the stated science objective(s)

GSFC can provide mission operations data systems and components for all mission operations functions. These systems can be used for pre-launch integration and test as well as operations. The GSFC mission operations architecture, called GMSEC (for the GSFC Mission Services Evolution Center), allows the mission operations functions to be easily integrated and invests in new technology to enable new capabilities, lower costs, and reduce operations risk.

The GSFC development services include the design and implementation of some or all of the mission operations systems for a mission and the training of the operations team in its use. The GMSEC architecture is modular, designed to accommodate components from other sources. The mission operations systems can be located at the users facility or at GSFC. GSFC can provide the operations team in either location.

Mailing Address:	NASA/GSFC Code 581 Steve Tompkins Greenbelt, MD 20771
Web Page	<a href="http://gmsec.gsfc.nasa.gov/">http://gmsec.gsfc.nasa.gov/</a> <a href="http://ssmo_home.hst.nasa.gov/">http://ssmo_home.hst.nasa.gov/</a>
Permanent email address	steve.tompkins@nasa.gov
Business phone	301 286-6791
FAX number	301 286-5719